

# Effect of ale, garlic, and soured cream on the appetite of leeches

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The medicinal leech has regained some of its lost popularity by its present use in microsurgery. Sometimes, however, the leeches refuse to cooperate properly. To overcome this problem doctors in the 19th century used to immerse leeches in strong beer before applying them to the patient.<sup>1</sup> In the 1920s a deaconess experienced that a little soured cream on the skin would encourage the leeches' feeding behaviour,<sup>2</sup> and we recently found that they seem to be attracted by garlic.<sup>3</sup> We designed a study to evaluate the effect of these remedies.

## Materials, methods, and results

Six leeches were dipped briefly in one of two different types of beer (Guinness stout or Hansa bock) or in water (control) before being placed on the forearm of one of us (HS). We measured the time from when the leech touched the skin until HS felt it bite. Each leech was exposed three times to each liquid in random order. As serotonin is known to control the feeding behaviour of the leech,<sup>4</sup> we also measured the serotonin content of both beers by high pressure liquid chromatography.

Six other leeches were then placed on the same author's forearms without being dipped in beer or water. The left forearm was either not prepared or smeared with soured cream. The right forearm was smeared with garlic. The leeches were placed on the differently prepared arms in random order. We planned to place each leech on each arm seven times, but because of adverse effects only two leeches were exposed to garlic. The four remaining leeches completed the study as planned with the other preparations.

We analysed the median time from application to biting. Some leeches did not bite within the predefined time limit of 300 s, but as the study was run according to the intention to bite principle, these incidences were registered with a time interval of 301 s in the statistical analysis (paired Wilcoxon test).

After exposure to beer some of the leeches changed behaviour, swaying their forebodies, losing grip, or

falling on their backs. Leeches dipped in Guinness bit after 187 s, those dipped in Hansa after 136 s, and controls after 92 s (table). The serotonin content was low and similar for the two beers (0.1 µg/ml).

Two leeches placed on the forearm smeared with garlic started to wriggle and crawl without assuming the sucking position. They were placed in water, but their condition deteriorated. When placed on a bare arm they tried to initiate feeding but did not manage to coordinate the process. Both died 2½ hours after the exposure to garlic. For ethical reasons the garlic arm was abandoned at this point.

Leeches exposed to soured cream sucked frantically on the wall of their container after they had been on the arm. While on the arm smeared with cream, however, they bit no sooner than the controls (table).

*Leeches' willingness to bite after being exposed to beer, garlic, and soured cream*

Type of exposure	No of leeches	No of exposures for each leech	Time from application to biting (seconds)	
			Median	Range
Guinness stout	6	3	187*	38-301
Hansa bock	6	3	136	12-301
Water	6	3	92	7-301
Garlic	2	1	†	
Soured cream	4	7	25	2-301
Bare arm	4	7	34	2-301

\*P=0.06 compared with control (water). †Due to the lethal effect of garlic, the leeches were unable to initiate feeding.

## Comment

Exposure to beer tended to disrupt the leeches' normal behaviour and made them erratic. However, the most interesting effect was that of direct exposure to garlic. Ingested garlic has been reported to be lethal to some animals,<sup>5</sup> but we believe this to be the first study showing garlic to be lethal by skin absorption. Garlic has a definite force of attraction on leeches,<sup>3</sup> but further research into this fatal attraction will require in depth qualitative methods.

The alleged effect of soured cream may have been an extrapolation of the deaconess's own preferences, an example of the placebo effect. An inert substance in the hands of the believer may work well, even on leeches. This study provides a reminder of how medical beliefs can stand uncontradicted for decades. We should never forget the necessity of critical research on commonly accepted medical truths.

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- 1 Means to force leeches to suck blood [in Norwegian]. *Eyr* 1828;3:57-8.
- 2 Laerum OD. Rebirth of old methods [in Norwegian]. *Tidsskr Nor Laegeforen* 1991;111:924-5.
- 3 Sandvik H, Baerheim A. Does garlic protect against vampires? An experimental study [in Norwegian]. *Tidsskr Nor Laegeforen* (in press).
- 4 Lent CM, Dickinson MH. The neurobiology of feeding in leeches. *Sci Am* 1988;258:98-103.
- 5 Joseph PK, Rao KR, Sundares C. Toxic effect of garlic extract and garlic oil in rats. *Indian J Exp Biol* 1989;27:997-9.

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A leech at work on an unembellished arm

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